

Amendments to the Claims:

This listing of claims will replace all prior versions of the claims in this application:

Listing of Claims:

Claim 1 (currently amended): A method for producing a microlens array, said microlens array having a surface configuration having peaks and valleys and comprising a plurality of unit cells and a plurality of microlenses, one microlens per unit cell, said method comprising:

- (a) providing a positive photoresist;
- (b) exposing the positive photoresist with a laser beam having a finite beam width at the photoresist, said exposing being performed using a direct laser writing process which employs relative movement between the finite beam width of the laser beam and the positive photoresist to form a latent image in the photoresist;
- (c) developing the latent image to form a photoresist master, said photoresist master having a surface configuration which is substantially the negative of the surface configuration of the microlens array; and
- (d) using the photoresist master to:
 - (i) produce the microlens array, and/or
 - (ii) produce a further master used to form the microlens array, said further master having a surface configuration which is substantially the negative of the surface configuration of the microlens array;

wherein:

(A) said microlens array comprises only ~~at least two~~ convex microlenses at adjacent unit cells so that the photoresist master and the further master if produced comprises only ~~at least two~~ concavities at adjacent unit cells;

- (B) the microlens array has a focusing efficiency greater than 50 percent; and
- (C) the microlens array would have a focusing efficiency of 50 percent or less if prepared by the same direct laser writing process using the same laser beam with the same finite beam width at the photoresist but with the photoresist master being written so as to comprise convexities at adjacent unit cells rather than concavities.

Claim 2 (canceled)

Claim 3 (currently amended): The method of Claim 1 wherein the photoresist master lies between a first plane and a second plane, the concavities extend into the photoresist master in the direction from the first plane towards the second plane, and the maximum sag of each concavity is at the first plane.

Claim 4 (currently amended): The method of Claim 1 wherein the photoresist master lies between a first plane and a second plane, the concavities extend into the photoresist master in the direction from the first plane towards the second plane, and the location of the maximum sag of each concavity relative to the first plane varies between at least some adjacent unit cells at a sufficiently slow rate so that the focusing efficiency of the microlens array is not reduced below 75 percent.

Claim 5 (currently amended): The method of Claim 1 wherein the photoresist master lies between a first plane and a second plane, the ~~at least two~~ concavities extend into the photoresist master in the direction from the first plane towards the second plane, and the distances between the apexes of the ~~at least two~~ concavities and the first plane are different.

Claim 6 (original): The method of Claim 5 wherein said distances are randomly distributed.

Claim 7 (currently amended): The method of Claim 1 wherein at least one of said ~~at least two~~ concavities is anamorphic.

Claim 8 (original): The method of Claim 1 wherein the microlens array has a focusing efficiency of at least 75 percent.

Claim 9 (original): The method of Claim 1 wherein the microlens array has a focusing efficiency of at least 85 percent.

Claim 10 (original): The method of Claim 1 wherein the microlens array has a focusing efficiency of at least 95 percent.

Claim 11 (original): The method of Claim 1 wherein the fill factor of the microlens array is at least 90 percent.

Claim 12 (original): The method of Claim 1 wherein the fill factor of the microlens array is at least 95 percent.

Claim 13 (original): The method of Claim 1 wherein the fill factor of the microlens array is substantially equal to 100 percent.

Claims 14-23 (canceled)

Claim 24 (previously presented): The method of Claim 1 wherein the microlens array has a focusing efficiency of at least 75 percent and a fill factor of at least 90 percent.

Claim 25 (previously presented): The method of Claim 1 wherein the microlens array has a focusing efficiency of at least 95 percent and a fill factor substantially equal to 100 percent.

Claim 26 (previously presented): The method of Claim 6 wherein the microlens array has a focusing efficiency of at least 75 percent.

Claim 27 (previously presented): The method of Claim 6 wherein the fill factor of the microlens array is at least 90 percent.

Claim 28 (previously presented): The method of Claim 6 wherein the microlens array has a focusing efficiency of at least 75 percent and a fill factor of at least 90 percent.

Claim 29 (previously presented): The method of Claim 6 wherein the microlens array has a focusing efficiency of at least 95 percent and a fill factor substantially equal to 100 percent.

Claim 30 (new): A method for producing a microlens array, said microlens array having a surface configuration having peaks and valleys and comprising a plurality of unit cells and a plurality of microlenses, one microlens per unit cell, said method comprising:

- (a) providing a positive photoresist;
- (b) exposing the positive photoresist with a laser beam having a finite beam width at the photoresist, said exposing being performed using a direct laser writing process which employs relative movement between the finite beam width of the laser beam and the positive photoresist to form a latent image in the photoresist;
- (c) developing the latent image to form a photoresist master, said photoresist master having a surface configuration which is substantially the negative of the surface configuration of the microlens array; and
- (d) using the photoresist master to:
 - (i) produce the microlens array, and/or

- (ii) produce a further master used to form the microlens array, said further master having a surface configuration which is substantially the negative of the surface configuration of the microlens array;

wherein:

(A) said microlens array comprises only convex microlenses at adjacent unit cells so that the photoresist master and the further master if produced comprises only concavities at adjacent unit cells;

(B) the microlens array has a focusing efficiency greater than 75 percent; and

(C) the microlens array would have a focusing efficiency of 75 percent or less if prepared by the same direct laser writing process using the same laser beam with the same finite beam width at the photoresist but with the photoresist master being written so as to comprise convexities at adjacent unit cells rather than concavities.

Claim 31 (new): The method of Claim 30 wherein the photoresist master lies between a first plane and a second plane, the concavities extend into the photoresist master in the direction from the first plane towards the second plane, and the distances between the apexes of the concavities and the first plane are different.

Claim 32 (new): The method of Claim 31 wherein said distances are randomly distributed.

Claim 33 (new): The method of Claim 30 wherein at least one of said concavities is anamorphic.

Claim 34 (new): A method for producing a microlens array, said microlens array having a surface configuration having peaks and valleys and comprising a plurality of unit cells and a plurality of microlenses, one microlens per unit cell, said method comprising:

- (a) providing a positive photoresist;
- (b) exposing the positive photoresist with a laser beam having a finite beam width at the photoresist, said exposing being performed using a direct laser writing process which employs relative movement between the finite beam width of the laser beam and the positive photoresist to form a latent image in the photoresist;
- (c) developing the latent image to form a photoresist master, said photoresist master having a surface configuration which is substantially the negative of the surface configuration of the microlens array; and
- (d) using the photoresist master to:
 - (i) produce the microlens array, and/or
 - (ii) produce a further master used to form the microlens array, said further master having a surface configuration which is substantially the negative of the surface configuration of the microlens array;

wherein:

- (A) said microlens array comprises only convex microlenses at adjacent unit cells so that the photoresist master and the further master if produced comprises only concavities at adjacent unit cells;
- (B) the microlens array has a focusing efficiency greater than 85 percent; and
- (C) the microlens array would have a focusing efficiency of 85 percent or less if prepared by the same direct laser writing process using the same laser beam with the same finite beam width at the photoresist but with the photoresist master being written so as to comprise convexities at adjacent unit cells rather than concavities.

Claim 35 (new): The method of Claim 34 wherein the photoresist master lies between a first plane and a second plane, the concavities extend into the photoresist master in the direction from the first plane towards the second plane, and the distances between the apexes of the concavities and the first plane are different.

Claim 36 (new): The method of Claim 35 wherein said distances are randomly distributed.

Claim 37 (new): The method of Claim 34 wherein at least one of said concavities is anamorphic.

Claim 38 (new): A method for producing a microlens array, said microlens array having a surface configuration having peaks and valleys and comprising a plurality of unit cells and a plurality of microlenses, one microlens per unit cell, said method comprising:

- (a) providing a positive photoresist;
- (b) exposing the positive photoresist with a laser beam having a finite beam width at the photoresist, said exposing being performed using a direct laser writing process which employs relative movement between the finite beam width of the laser beam and the positive photoresist to form a latent image in the photoresist;
- (c) developing the latent image to form a photoresist master, said photoresist master having a surface configuration which is substantially the negative of the surface configuration of the microlens array; and
- (d) using the photoresist master to:
 - (i) produce the microlens array, and/or
 - (ii) produce a further master used to form the microlens array, said further master having a surface configuration which is substantially the negative of the surface configuration of the microlens array;

wherein:

(A) said microlens array comprises only convex microlenses at adjacent unit cells so that the photoresist master and the further master if produced comprises only concavities at adjacent unit cells;

(B) the microlens array has a focusing efficiency greater than 95 percent; and

(C) the microlens array would have a focusing efficiency of 95 percent or less if prepared by the same direct laser writing process using the same laser beam with the same finite beam width at the photoresist but with the photoresist master being written so as to comprise convexities at adjacent unit cells rather than concavities.

Claim 39 (new): The method of Claim 38 wherein the photoresist master lies between a first plane and a second plane, the concavities extend into the photoresist master in the direction from the first plane towards the second plane, and the distances between the apexes of the concavities and the first plane are different.

Claim 40 (new): The method of Claim 39 wherein said distances are randomly distributed.

Claim 41 (new): The method of Claim 38 wherein at least one of said concavities is anamorphic.